**Policy for Science & Science for Policy**

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**Office hours**: Veritas Hall B 430 Wed 1-2 and by appointment.

Industry funding has become the major source of income for scientific research. In addition to economic forces causing this trend, a number of non-profit and government agencies (e.g. the Gates Foundation, the Wellcome trust, the President’s Council of Advisors on Science and Technology, the Food and Drug Administration, etc.) are recommending more collaboration between industry and academia. The entire field of biomedicine is undergoing a massive shift along these lines as pharmaceutical companies shift their R&D work into universities under the rubric of translational medicine. Similarly, most of the work assessing the safety of industrial chemicals is conducted by the companies that produce them. Yet concurrent with this shift towards industry funding, there has been growing concern with the ways in which industry “bends science”. This course examines the significant changes to scientific organization that have occurred since WWII, how privatization of scientific research changes the nature of the scientific endeavor, and what is at stake if this trend continues.

1. **Policies:**

**‡ Grading:** There are 100 available points. The class is based on a relative grading scale

according to Yonsei University grading policy. That means that classes with an enrollment of >20 can have at most 35% in the A-range and 35% in the B-range, and classes with an enrollment of ≤20 can have at most 40% in the A-range and 50% in the B-range. Since the Yonsei online grade-submission system will not accept (or even allow) submission of grades that violate these restrictions, I am required to follow these guidelines. Hence, I have refrained from giving letter grades on assignments and exams.

The default floor for the grading percentages will be:

|  |  |  |  |
| --- | --- | --- | --- |
|  | + | 0 | - |
| A | 96 | 92.5 | 90 |
| B | 87.5 | 82.5 | 80 |
| C | 77.5 | 72.5 | 65 |
| F |  | Below 65 |  |

**‡ Attendance & Participation:**

Attendance will be taken in accordance with Yonsei Policy: missing 1/3 of all classes, regardless of having legitimate, official excuses, is to result in an F grade. Being more than twenty minutes late will be counted as an absence. You will be allowed six absences (excused/unexcused). Long days count as two classes. (Hence, you`re allowed two weeks of absences).

Students are expected to come to class prepared and ready to engage in an informed discussion of the material. Students are expected to actively participate in classroom discussions. Participation includes asking questions, raising objections, offering defenses, commenting on the significance of a point, clarifying an argument or a claim, and drawing out the connections between an issue from our current discussion and issues raised in our other readings.

**‡ Extensions or alternative test times:** All assignments are due at the beginning of class.

Students will have a ten minute grace period after which point the assignment will be considered late. Generally, no changes will be made to the dates listed. Exceptions will be handled on a case by case basis and will not, in any circumstances, be altered without supporting documentation. The penalty for turning in an assignment late will be a third of a grade deduction per day (or any portion thereof). It is the students responsibility to ensure that the paper they submit is the correct paper. If the wrong paper is uploaded to the drop box it will be treated as if no paper had been turned in and late penalties will accrue accordingly.

**‡ Academic Integrity:** All students are expected to be familiar with and abide by the

universities policies on academic integrity. Any failure to abide by this policy will result in a failing grade for the course and letter to the dean reporting the incident. For more information, please visit http://uic.yonsei.ac.kr/

and navigate to Home>Academics>Academic Regulations.

**‡ Disabilities and Special Needs:** I am happy to make any accommodations to facilitate

students learning. Please see me at the beginning of the semester to discuss such issues.

**‡ Preferred names and Gender Pronouns:** I would like to make every effort to create a safe

space. If you have a preferred name or gender pronoun that is not reflected in the roster, please let me know.

**‡ This syllabus may be updated as the semester proceeds. Any such changes will be announced in class as well as by email.**

**2. Participation (Bonus)**

Active and informed participation: Students are expected to come to class prepared and ready to engage in an informed discussion of the material. Students are expected to actively participate in classroom discussions. Participation includes asking questions, raising objections, offering defenses, commenting on the significance of a point, clarifying an argument or a claim, and drawing out the connections between an issue from our current discussion and issues raised in our other readings. Substantial contributions can raise your grade.

**3. Mid-term (50% of final grade) and Final exam (50% of final grade)**:Exams will include short answer and essay questions. The short answer responses will involve summarizing the main argument of a paper read for class. The essay questions will ask you to summarize one of the main positions explored in the class, explain objections to that position, and explain whether you think the objections are successful (i.e. justify your own position). The final exam will focus on the second half of the class, but as earlier material is relevant to later material, the exam is to some degree cumulative.

**Week 1 & 2 (Sept 5- 12): Early Reflections on the Economics of Science**

**No class Wed Sept 14**

How should we conceive of the production of science. Is it just another manufactured good or is it instead a problem of information processing. If the former, how can use what we know about the manufacturing of other goods to improve resource allocation and maximize the amount of science produced. To what extent should resources be invested in “early stage production” in order to maximize long term return.

1. The Simple Economics of Basic Scientific Research (Richard R. Nelson) 1959 (pp. 151-157)
2. The Simple Economics of Basic Scientific Research (Richard R. Nelson) 1959 (pp. 157-164)

**Week 3 & 4 (Sept 19-28): Render unto Caesar**

What is the role of state actors play in the scientific endeavor? Why should central governments, acting on behalf of citizens, distribute tax dollars to fund science that will be handed over to private corporations?

1. “Call it a War” p. 1-8 of *Endless Frontier: Vannevar Bush, Engineer of the American Century* &

Bush, V. (1945) *Science: The Endless Frontier* (p. 1-10)

1. Vannevar Bush, V. (1945) *Science: The Endless Frontier* (p. 10-40)

**Week 5 (Oct 5): Impure Science**

**No class Oct 3**

*The Endless Frontier* presupposes that there is a basic distinction between pure and applied research. To what extent does a contextualized history of science show that this division distorts the interplay between the goals of knowledge and useful application. If we find that this division is indeed misconceived, how should federal science policy revised to incorporate a more sophisticated understanding of scientific activity.

1. Donald Stokes (1997).  *Pasteur’s Quadrant.* Brookings Institution Press, (pp. 58-89)

**Week 6 (Oct 10-12): The Enclosure of Knowledge**

**October 12th will be a video lecture**

Knowledge is typically seen as a public good, to be freely shared. However, in a for-profit business publishing results decreases your edge over competitors. This section explores the birth of the biomedical industry and the industrial needs of “ownership” and the ways that emerging pharmaceutical companies tried to negotiate the demands of science and imperatives of business.

1. Joseph M. Gabriel, "A Thing Patented is a Thing Divulged: Francis E. Stewart, George S. Davis, and the Legitimization of Intellectual Property Rights in Pharmaceutical Manufacturing, 1879-1911" *Journal of the History of Medicine and Allied Sciences* 64:2 (2009), 135-172

**Week 7 (OCT 17TH) MIDTERM**

**Week 8: (Oct 24-26): Patents and the Power of the Free Market**

Following from the previous section, we will now turn to the modern patent system. We will consider whether patenting and the profit motive are effective at producing new knowledge or whether such research should be publicly funded.

8) James Robert Brown, “Socializing Medical Research” (Forthcoming)

Julian Reiss, “Meanwhile, Why Not Biomedical Capitalism?” (Forthcoming)

**Week 9 - 10: (Oct 31- Nov 9) Science in Public Decision Making and the Politicization of Science**

**Wed Nov 2 will a video lecture**

Increasingly governments have turned to science to inform policy decisions. This has in turn led to a new demand to produce results that fit with predetermined policy agendas. Policy disputes become scientific disputes become policy disputes. Dueling experts charge each other with conducting “junk science.” In this section we examine how science functions in modern democracies and whether “junk science” retains any meaning beyond science whose results suggest policies one disagrees with.

9) McGrarity, T. (2003-2004). Our Science Is Sound Science and Their Science Is Junk Science: Science-Based Strategies for Avoiding Accountability and Responsibility for Risk-Producing Products and Activities *University of Kansas Law Review*, 52, 897

1. Oreskes, N. and E. Conway (2010). “The Denial of Global Warming” From *Merchants of Doubt*

WEDNESDAY’S MEETING WILL BE A JOINT MEETING WITH MY HISTORY OF SCIENCE COURSE ON WEDNESDAY EVENING (7 PM)

**Week 11 (Nov 14-16): Industry and the Research University**

The privatization of knowledge has significant consequences for the future of the research university. The course closes by examining what function the research university should be. We will look at the State’s distribution of research funds and how it encourages universities to adopt practices that begin to resemble science in the private interest. This change brings both risks and rewards, we close by examining the trade-offs of the changing status of The Research University

1. Steve Fuller (2010) Capitalism and Knowledge: The University between Commodification and Entrepreneurship

**Week 12 - 14 (Nov 21 – Dec 7): Science and Industry in Korea**

We close the class by considering how these issues play out in the Korean context

1. Why South Korea is the World’s Biggest Investor in Research (2016). *Nature, 534,* (pp. 20-23).

Mun Su Park, Seung Ouk Jeong, Tae-Sik Park University-Industry Cooperation Policy in Korea: Implementation and Implication of the Enactment of Law of Industrial Education and University-Industry Cooperation, 2003-2011. *Asian Research Policy 2014*

1. Korean Supreme court decision on whether tobacco companies can be held accountable for causing lung cancer.

Khang, Y. H. (2015). The causality between smoking and lung cancer among groups and individuals: addressing issues in tobacco litigation in South Korea. *Epidemiology and health*, *37*

14) (KORUS-AQ) Chang-Keun Song, Lim-Seok Chang, Gangwoong Lee, Jhoon Kim, and Rokjin Park Megacity Air Pollution Studies – Seoul